

subject to technical rules we will adopt. Therefore, we have not delegated to private parties our responsibility to allocate spectrum and adopt appropriate technical standards.

68. We find that, when we propose licensing and other service rules for the 47 GHz band, we will follow the approach proposed in the *First NPRM* to tailor the rules to reflect what we expect will likely be the dominant use of this spectrum, while retaining the flexibility allowed under the Allocation Table. Especially for "frontier" bands such as those above 40 GHz, this approach should set allocation and licensing rules that promote rapid, efficient use of this spectrum to meet all the communications needs advanced by commenters, while allowing the market to adjust to changing needs and technologies and providing scope for innovative uses. It will also minimize regulatory barriers and requirements that might otherwise hamper entrepreneurial efforts to develop effective commercial uses of this spectrum.

69. However, we do not find that the dominant use of spectrum in the 47 GHz band is likely to be similar to LMDS in the 28 GHz band, as we proposed. As Avant-Garde requests, we have reexamined our proposal, and we have taken into account the anticipated uses and changed circumstances reflected in the record for purposes of determining whether another licensing methodology would better meet the needs posed by those anticipated uses. Only Sky Station has submitted comments that propose specific uses for the 47 GHz band, apart from the general millimeter wave uses otherwise expressed in the comments or the general support confirming our expectation of fixed, point-to-multipoint services in the band. We find that the dominant use of the 47 GHz band is likely to be a fixed, point-to-multipoint service that employs stratospheric platforms at fixed locations.

70. We emphasize, however, that we anticipate that ongoing technological developments can be expected to generate other types of delivery systems for fixed, point-to-multipoint services in the band.<sup>103</sup> Thus, while we will seek to tailor our licensing rules to accommodate the likely dominant use we have identified based on the current record, we will not foreclose other uses permitted by the Allocation Table, including new and innovative uses and technologies.

71. We deny Sky Station's request that we dedicate to its exclusive use two portions of the 47 GHz band for its service and modify the Allocation Table to that effect. Sky Station is concerned about interference to its stratospheric signal when it is in the main path of a conventional fixed co-channel signal of greater power. The problems of interference do not necessarily require a change in the service allocation, but rather are the subject of operational and technical mitigation techniques that can be included in our service rules to be used

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<sup>103</sup> For example, Motorola recently filed an application to initiate a new M-Star system employing 72 satellites that proposes to use, as pertinent, the 47.2-50.2 GHz band for Earth-to-space to provide broadband satellite services on a global basis. The application was placed on public notice and is pending. *36-51 GHz Band Plan NPRM*, at paras. 6 n.6, 22.

to reduce or eliminate these types of interference problems. Accordingly, Sky Station should ensure that its concerns are addressed when we seek to adopt appropriate service rules in a subsequent proceeding to implement services under the Allocation Table.

72. Similarly, we defer the request of USSB that we accept a service rule requirement submitted by Sky Station to protect DBS-TV from interference from Sky Station's service.<sup>104</sup> USSB requested we consider the impact of Sky Station's proposed platform-based service on the operations of other telecommunications services and, in particular, on the reception of DBS signals on the surface of the earth.<sup>105</sup> We will consider the requested restriction when we consider the need for other use restrictions to ensure the performance of the authorized services under appropriate service rules.

73. We also deny the request of TIA for a guardband of 500 MHz to ensure adequate signal selectivity between the licensed services in the 47 GHz band and the fixed point-to-point services that TIA requests we designate for use in the adjacent band at 48.5-51.4 GHz. The adjacent band is under consideration in the *36-51 GHz Band Plan NPRM* and TIA's request can be addressed there. We will consider the need for protections of licensed users from interference in developing service rules that govern the uses of 47 GHz.

## **E. Area-Wide Licensing and License Blocks**

### **1. Comments**

74. In the *First NPRM*, we pointed out that fixed point-to-point and point-to-multipoint services, which we expected in the bands above 40 GHz to be like LMDS, are provided to subscribers throughout a geographic area. We sought comment on the extent to which there is a significant commercial interest in obtaining exclusive, area-wide use of millimeter wave spectrum and, if so, what size licensing areas and spectrum blocks should be used.<sup>106</sup>

75. In requesting us to expand the proposed bands to provide for point-to-point services, Alcatel, HCP, HP, Harris, mmWAG, and TIA do not oppose the area-wide licensing we proposed for the 47 GHz band to allow for the services we expected would be the primary commercial use of the band. HCP states that the proposed bands would be for wide area services, while TIA states that the 47 GHz band would be retained for the licensed uses we proposed.<sup>107</sup> HP and mmWAG suggest that an expanded 47 GHz band could be used for expand-

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<sup>104</sup> USSB Reply Comments to Request and Petition at 1-2.

<sup>105</sup> USSB Comments to Request and Petition at 1-2.

<sup>106</sup> *First NPRM*, 9 FCC Rcd at 7088, 7090 (paras. 23, 28).

<sup>107</sup> HCP Reply Comments at 2; TIA Reply Comments at 9.

ed multipoint distribution service.<sup>108</sup> They request that, under their proposal to expand the band to 50.2 GHz, we authorize at least one gigahertz to each license and retain flexibility in granting broader bandwidths so that multi-gigahertz services will be possible. HP favors the licensing of large service areas. It argues that they afford a licensee more flexibility in designing a network and greater incentive to make the investments required to take full advantage of millimeter wave technology. Such areas also minimize the boundaries across which standard protocols and interference levels would have to be addressed.<sup>109</sup>

76. Pacific Bell supports our proposal to allocate the 47 GHz band for licensing under the proposed framework. However, it asserts that the proposed licensing areas and blocks are for broadband interests and it is concerned that narrowband interests not be excluded from our consideration. Pacific Bell requests some additional division in the 47 GHz band to accommodate some narrowband applications. It argues that there should be provisions for point-to-point microwave links in blocks similar to our rules for 38 GHz. Pacific Bell also argues that smaller areas, such as BTAs, may be more appropriate for narrowband applications than the MTAs we proposed for licensing areas, which it argues are much larger and appropriate for such wideband uses as LMDS. Pacific Bell requests that we consider carefully what service area is most appropriate for the bandwidth available in a particular frequency band.<sup>110</sup>

77. P-Com requests that we divide the spectrum allocations carefully to reflect the proposed usage of the spectrum. Paired blocks with maximum frequency separation are required for fixed service, two-way links. It contends that the larger the percentage frequency separation, the easier is the RF filter implementation, but that separation at higher frequencies would require a greater total amount of spectrum to be available. P-Com argues that for point-to-multipoint applications, contiguous blocks of spectrum are required to allow the use of multichannel operation within a given service area.<sup>111</sup>

78. Sky Station supports area-wide licensing to accommodate its service proposal within the United States and requests that we adopt rules similar to the rules for Personal Communications Services (PCS) that provide for larger areas, such as national or super-regional areas, to reflect the broad scope of its proposed services. Sky Station requests that we clarify that, like the PCS rules, we will authorize a blanket license for each market and frequency block that allows a single station to serve an entire service area rather than individual sites. Sky Station argues that, for its service, licenses should be divided into pairs of 100 MHz each, with a separation of at least 500 MHz.<sup>112</sup>

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<sup>108</sup> HP Reply Comments at 5; mmWAG Reply Comments at 3.

<sup>109</sup> HP Comments at 2.

<sup>110</sup> Pacific Bell Comments at 2-3.

<sup>111</sup> P-Com Reply Comments at 2.

<sup>112</sup> Sky Station Further Comments at 6-7, 11, citing 47 C.F.R. § 24.102.

## 2. Discussion

79. We adopt our proposal to issue area-wide licenses for services in the 47 GHz band as a necessary component of the flexible licensing framework we are adopting. We have found that the predominant use of the band is a fixed point-to-multipoint service, which is a service provided on a point-radius basis within an area and not on a fixed point-to-point basis. However, fixed point-to-point service is not precluded and may be provided within the area. Moreover, authorization of a geographic area is consistent with the Allocation Table for the 47 GHz band, which also provides for mobile services in addition to fixed services. We do not decide the size of the geographic area in this Order, inasmuch as that is a matter for the service rules.

80. As HP points out, area-wide licensing is important to achieving the flexible licensing framework we are adopting for 47 GHz. In licensing wireless services under similar frameworks, we have concluded that licensing based on pre-defined service areas poses significant advantages over site-based licensing for entities providing subscriber-based services because of the greater operational flexibility it gives licensees and the greater ease of administration for the Commission.<sup>113</sup> Licensing on the basis of geographic service areas facilitates operation of a broad range of new services and promotes their introduction in the most rapid and efficient manner.<sup>114</sup> It also simplifies system expansion and reduces administrative burdens on the licensees and the Commission by permitting licensees to construct and operate stations anywhere within the area.<sup>115</sup> We conclude that these benefits should also be available to commercial users of the 47 GHz bands in order to promote the most efficient use of the spectrum.

81. We also adopt our plan to divide the spectrum into license blocks for exclusive assignment in each area. However, we modify our proposal to divide the entire band into only one contiguous pair and instead divide it into five separated pairs, based on the comments we received in response to our inquiry into whether the licensed blocks should be contiguous or further subdivided into paired blocks to facilitate two-way transmission. As P-Com argues, we

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<sup>113</sup> Amendment of the Commission's Rules Regarding Multiple Address Systems, WT Docket No. 97-81, Notice of Proposed Rulemaking, FCC 97-58, released Feb. 27, 1997 (*MAS NPRM*).

<sup>114</sup> *Part 27 Report and Order*, at para. 47.

<sup>115</sup> For mobile services, see Amendment of Part 90 of the Commission's Rules to Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service: PR Docket No. 89-552, RM-8506; Implementation of Sections 3(n) and 332 of the Communications Act: Regulatory Treatment of Mobile Services: GN Docket No. 93-252; Implementation of Section 309(j) of the Communications Act - Competitive Bidding: PP Docket No. 93-253, Third Report and Order and Fifth Notice of Proposed Rulemaking, FCC 97-57, released March 15, 1997 (*220 MHz Third Report and Order*), at paras. 36, 80, adopting Section 90.763(a) and (b)(4), 47 C.F.R. § 90.763(a), (b)(4). For fixed services, see *LMDS Second Report and Order*, at paras. 222 and 235, adopting Section 101.1009, 47 C.F.R. § 101.1009.

should divide the spectrum into license blocks that reflect the uses, which are predominantly fixed point-to-multipoint operations but may include any service under the Allocation Table. We find that our original proposed division into one paired block would not be appropriate and would inhibit the most efficient and effective use of the 47 GHz band.

82. We find that Sky Station's proposal to divide the entire block into five pairs of 100 MHz channels each, separated by 500 megahertz, effectively accommodates the predominant use as well as the other likely uses of the band. That includes point-to-multipoint uses based on traditional tower-based equipment as well as the stratospheric-based platforms proposed by Sky Station. Although HP requests much larger blocks of one gigahertz each, that was based on our adopting its proposed expansion of the band to three gigahertz, rather than the one gigahertz we adopt here. We find that paired 100-MHz channels would provide adequate bandwidth for the dominant use, while fostering competition and diversity of uses among licensees. Separating the paired channels by 500 MHz provides the maximum frequency separation within the band in order to facilitate system design and reduce interference problems without affecting the use of multichannel operation that are accommodated in the pairs.

83. In the *First NPRM*, we proposed to impose a spectrum cap and limit each licensee to a single spectrum block in each band in the same area, so that the licensee would not be permitted to own both licenses in the same band in any area.<sup>116</sup> We will address any spectrum limitation in the proceeding to establish the service rules to implement the framework we adopt here, which proceeding we will initiate shortly.

#### IV. PROCEDURAL MATTERS; ORDERING CLAUSES

84. The Final Regulatory Flexibility Analysis, as required by Section 604 of the Regulatory Flexibility Act,<sup>117</sup> is set forth in Appendix B.

85. IT IS ORDERED that the actions of the Commission herein ARE TAKEN pursuant to Sections 4(i), 257, 303(r), and 309(j) of the Communications Act of 1934, 47 U.S.C. §§ 154(i), 257, 303(r), 309(j).

86. IT IS FURTHER ORDERED that these actions SHALL TAKE EFFECT sixty days after publication of a summary of this Second Report and Order in the Federal Register.

87. IT IS FURTHER ORDERED that the Request and Petition and Application filed by Sky Station, the Further Comments filed by Sky Station, and the comments and reply comments filed in response thereto, ARE ACCEPTED in this record as late-filed comments.

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<sup>116</sup> *First NPRM*, 9 FCC Rcd at 1089 (para. 24).

<sup>117</sup> 5 U.S.C. § 604.

88. IT IS FURTHER ORDERED that the spectrum 47.2-48.2 GHz (47 GHz band) IS DESIGNATED for licensed, commercial use on the basis of area-wide licenses in accordance with the terms of this Order.

89. IT IS FURTHER ORDERED that a division of the spectrum for license blocks IS ADOPTED for the 47 GHz band that divides the band into five spectrum blocks of 200 megahertz each for licensing, with each block consisting of a pair of 100 megahertz channels separated by 500 megahertz.

FEDERAL COMMUNICATIONS COMMISSION

  
William F. Caton  
Acting Secretary

**APPENDIX A**

**List of Pleadings**

**Comments and Replies to  
First Notice of Proposed Rulemaking**

**Comments**

Alcatel Network Systems (Alcatel)  
American Automobile Manufacturers Association (AAMA)  
American Council on Education, American Association of Community Colleges, California  
State University, Sacramento Education Network of Maine, State of Wisconsin Educational  
Communications board, and University of Wisconsin System (Educational Parties)  
American Radio Relay League, Inc. (ARRL)  
Apple Computer, Inc. (Apple)  
Association for Promotion of Vehicular Radar Bands (APMDU)  
AT&T Corp. (AT&T)  
Avant-Garde Telecommunications, Inc. (Avant-Garde)  
CellularVision  
Clarendon Foundation (Clarendon)  
ComTech Associates, Inc. (ComTech)  
Endgate Technology Corporation (Endgate)  
Epsilon Lambda Electronics Corp. (Epsilon Lambda or Epsilon)  
Fujitsu Limited (Fujitsu)  
Fujitsu Ten Limited (Fujitsu Ten)  
GE American Communication (GE Americom)  
General Motors Corporation and GM Hughes Electronics (GM)  
GHZ Equipment Co., Inc. (GEC)  
Harris Corporation-Farion Division (Harris)  
Hewlett-Packard (HP)  
Honda R&D, Ltd. and Honda R&D North America, Inc. (Honda)  
Hughes Aircraft Company, Communications Products Business Unit (HCP)  
Hughes Communications Galaxy, Inc. (Hughes)  
Martin Marietta Corporation (Martin Marietta)  
Metricom, Inc. (Metricom)  
Millimeter Wave Advisory Group (mmWAG)  
Mitsubishi Electric Corporation (Mitsubishi)  
National Academy of Sciences through the National Research Councils  
Committee on Radio Frequencies (CORF)  
National Aeronautics and Space Administration (NASA)  
Pacific Bell Mobile Services and Tesis Technologies Laboratory (Pacific)

P-Com, Inc. (P-Com)  
Rand McNally & Company (Rand McNally)  
Research and Development Center for Radio Systems (RCR)  
Rockwell International Corporation (Rockwell)  
Southwest Microwave Inc. (Southwest Microwave)  
Fixed Point-to-Point Communications Section, Network Equipment  
Division of the Telecommunications Industry Association (TIA)  
Teledesic Corporation (Teledesic)  
Toyota Motor Corporation (Toyota)  
Troy State University Montgomery (TSUM)  
TRW Inc. (TRW)  
United States Department of Commerce, National Telecommunications and Information Administration (NTIA)  
UTC, the Telecommunications Association  
Vorad Safety Systems, Inc. (VORAD)

**Replies**

AEL Industries, Inc. (AEL)  
Alcatel  
AAMA  
ARRL  
AT&T  
Ameritech  
Apple  
Association for Promotion of Millimeter-wave Development and Utilization (APMDU)  
Association of American Railroads (AAR)  
Association of America's Public Television Stations (APTS) and Public  
Broadcasting Service (PBS)  
Bell Atlantic  
CellularVision  
ComTech  
Digital Microwave Corporation (DMC)  
Dudley Lab  
Ford Motor Company (Ford)  
GE Americom  
GM  
Harris  
HP  
HCP  
Hughes  
Hughes, Electron Dynamic Division



Intelligent Transportation Society of America (ITS America)  
Lockheed Sanders, Inc. (Lockheed Sanders)  
M/A-COM, Inc. (MACOM)  
mm-Tech, Inc. (mm-Tech)  
mmWAG  
The Minority Media and Telecommunications Council (MMTC)  
Motorola Satellite Communications, Inc. (Motorola)  
NASA  
National Rural Telecommunications Cooperative (NRTC)  
Pacific  
UK Radiocommunication Agency  
Teledesic  
TIA  
Texas Instruments (TI)  
Titan Information Systems Corporation (Titan)  
Toyota  
TSUM  
TRW  
Video/Phone Systems, Inc. (Video/Phone)  
Western Cooperative for Educational Telecommunications

**June 23, 1995, FCC Public Notice  
Supplemental Comments on the Need to Harmonize the Proposed Spectrum  
Allocations with the European Spectrum Allocations  
(Above 40 GHz Public Notice)**

AAMA  
Alcatel  
ARRL  
CellularVision  
DMC  
Harris  
HP  
TIA

**April 1, 1996 FCC Public Notice  
Request to Establish New GSTS Service,  
Additional Comments, and Petition for Rulemaking (Request and Petition)  
Sky Station International, Inc.**

**Letters**

B. W. Hammond, Head, Information Systems Department, Britain's Overseas  
Development Administration  
Olympic Family Clinic Medical Corporation  
DB Management Company  
U.S. Robotics Corporation (US Robotics)  
Association of Air Medical Services  
Sygma Photo News  
Magnet Photo News  
James P. Leape, Senior Vice President, World Wildlife Fund (WWF)  
Arq. Ignacio Cabrera Fernandez, President of Mexican Movimiento  
Ecologista de Sonora, A.C. (MESOM)  
Dr. Donald B. Easum, Vice President, Global Business Access, Ltd.  
Wayne L. Sterling, Director, Virginia Department of Economic Development  
Los Angeles Urban League Business Development & Information Technology Center  
Volunteers in Technical Assistance (VITA)  
Climate Institute  
Eden Entertainment Ltd (US/UK) (Eden)  
Oliver Davidson  
Fernando de Cordova, Vice President, Morgan Guaranty Trust Company of New York  
(JPMorgan)  
Y. Rahmat-Samii, Professor, UCLA  
Chuan S. Liu, Professor, University of Maryland  
Paul Hommeyer, Vice President-Investments, PaineWebber  
John R. Reid, Senior Director, Information Services, CARE (CARE)  
Theodore W. Jones, Program Manager, The Alliance to Save Energy  
Claes Nobel, Founder & Chairman, United Earth  
The National Institute for Urban Search and Rescue  
Claude I. Salem, Sr. Public Sector Management Specialist, Human Resources and  
Social Development, Asia Technical Department, World Bank  
Center for Public Service Communications  
Kym H. Davis, Managing Director, AUSPROJECT Internation Pty. Ltd. (Australia)  
Mercy Medical Airlift  
Philip Leung Ph.D, Independent Consultant  
BET Holdings, Inc. (BET)

**Comments**

HCI  
Motorola  
TIA

United States Satellite Broadcasting Company (USSB)

**Reply Comments**

Harris Corporation - FARINON Division (Harris)  
Motorola  
Sky Station  
TIA  
USSB

**April 22, 1996, FCC Public Notice  
File No. 96-SAT-/LA-96 (March 20, 1996)  
Application of Sky Station International, Inc. (Application)**

**Letters**

Russell F. Imrie (Mohawk), Resource Coordinator/Internet Costanoan Indian Research,  
Inc.  
Gerald Musarra, Senior Director, Commercial Programs, Lockheed Martin  
Corporation

**Comments**

Petition to Deny, HCI  
Petition to Dismiss or Deny, Motorola  
Petition to Defer, TIA

**Reply Comments**

HCI  
Motorola  
Sky Station Consolidated Opposition

**Further Comments**

Sky Station

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APPENDIX B

## Final Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act, 5 U.S.C. § 603 (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *First NPRM* in this proceeding.<sup>1</sup> The Commission sought written public comments on the proposals in the *First NPRM*, including on the IRFA. The Commission's Final Regulatory Flexibility Analysis (FRFA) in this Second Report and Order (hereinafter in this Appendix referred to as the Order) conforms to the RFA, as amended by the Contract with America Advancement Act of 1996 (CWAAA), Pub. L. No. 104-121, 110 Stat. 846 (1996).<sup>2</sup>

**I. Need for and Objectives of Action**

We proposed in the *First NPRM* to open spectrum in the 47.4-48.2 GHz band for commercial, licensed use on an area-wide basis in a paired license block in order to promote the use of the millimeter wave region of the spectrum above 40 GHz. We adopt our proposals, with modification to the licensing blocks, for the entire 47.2-48.2 GHz band (47 GHz band) in order to achieve our goal to expedite the commercial development of this spectrum.

Advances in millimeter wave technology will enable new commercial uses to be achieved and will help meet consumer demand for a wide range of potential commercial services, which would stimulate research and the growth of technology. We adopt a licensing framework that allows the full range of services in the Table of Frequency Allocations to provide licensees the flexibility to provide the most efficient and effective services.<sup>3</sup> We identify the potential dominant use of the 47 GHz band to ensure that the service rules we will propose in a future proceeding are adequate and appropriate. Licensing on the basis of a geographic area will ensure that licensees have the flexibility to provide new services in the most rapid and efficient manner. Dividing the spectrum into five separated pairs of spectrum blocks for licensing ensures that licensees in the 47 GHz bands are able to offer the predominant service, as well as other potential services, in the most efficient manner.

**II. Summary of Significant Issues raised by the Public Comments in Response to Initial Regulatory Flexibility Statement**

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<sup>1</sup> Certain short form references used in the Second Report and Order are also used in this Appendix.

<sup>2</sup> Title II of the Contract with America Act is "The Small Business Regulatory Enforcement Fairness Act of 1996" (SBREFA), codified at 5 U.S.C. §§ 601 *et seq.*

<sup>3</sup> 47 C.F. R. § 2.106.

Avant-Garde and MACOM are small entities that generally support opening the bands above 40 GHz for commercial use to take advantage of the developments in millimeter wave technology. They argue that the technology is available for commercial uses and that we should designate any of the bands for commercial use in order to stimulate market demand for their products. Sky Station argues that its proposal to provide a fixed, terrestrial, global service in the 47 GHz band using stratospheric-based platforms will meet many commercial uses and promote the growth of a new stratospheric-based technology, rather than traditional tower-based technology, for delivery of service.

Metricom requests that we adopt a flexible regulatory approach for licensed operations that includes very broad and general rules to encourage the development of equipment and services. Avant-Garde argues that the spectrum to be made available for licensing should not be artificially constrained in the manner in which it is licensed or used. It requests that we reexamine our proposal to use the LMDS service rules to govern the predominant uses of the bands above 40 GHz in light of the anticipated uses and changed circumstances reflected in the filings. It questions whether the licensing scheme we proposed remains appropriate or whether some other methodology would better meet the needs of commercial service providers.

Sky Station argues that its stratospheric-based platforms would deliver point-to-multipoint services that can be licensed under the terrestrial, flexible rules we proposed to adopt for 47 GHz. It argues that its technology is uniquely suited to take advantage of the characteristics of the 47 GHz band and will promote the maximum use of that spectrum. Sky Station argues that the service cannot share co-channel frequencies with other services and requests we dedicate the segments of the band at 47.2-47.5 GHz and 47.9-48.2 GHz to its exclusive use and modify the Table of Frequency Allocations accordingly.

Sky Station supports the use of area-wide licensing and requests that we adopt large service areas that are super-regional in size. Sky Station opposes our proposal to adopt a single pair of contiguous license blocks, and argues that the spectrum should be divided into five pairs of 100 MHz each that are separated by 500 MHz to ensure flexibility. P-Com argues that we should be careful to divide the spectrum to reflect the proposed use, and that paired blocks with maximum frequency separation are required for fixed service, two-way links such as point-to-multipoint operations.

### **III. Description and Estimate of the Number of Small Entities to Which Rules Will Apply**

The determinations we adopt to open 47 GHz for commercial use under a flexible licensing framework authorizing any service under the Table of Frequency Allocations on an area-wide basis would apply to all entities that apply for a license, including small entities.

The definition that SBA has developed that approximates most closely the services that may be provided by the licensees would be the definition applicable to radiotelephone companies. The definition of radiotelephone companies provides that a small entity is a radiotelephone company employing 1,500 or fewer persons.<sup>4</sup> The size data provided by SBA do not enable us to make an accurate estimate of the number of telecommunications providers which are small entities because it combines all radiotelephone companies with 500 or more employees.<sup>5</sup> We therefore use the 1992 Census of Transportation, Communications, and Utilities, conducted by the Bureau of the Census, which is the most recent information available. This document shows that only 12 radiotelephone firms out of a total of 1,178 such firms which operated during 1992 had 1,000 or more employees.<sup>6</sup> Therefore, the majority of entities to provide telecommunications services in the 47 GHz band may be small businesses under SBA's definition.

The Commission has not developed a definition of small entities applicable to licensees in the 47 GHz band, because the band is being opened for the first time for commercial, licensed use in this Order and has not been subject to licensing. The RFA amendments were not in effect when the *First NPRM* was released, and no data has been received establishing the number of small businesses to be associated with services in the band. Although we proposed to auction the spectrum for assignment, we did not request information regarding the potential number of small businesses interested in obtaining licenses. We do not adopt in the Order our proposal to auction the spectrum, and instead will seek additional comment in a future Notice of Proposed Rulemaking in which we will also propose the service rules to implement services in the 47 GHz band. Thus, we are unable to estimate the potential number of entities that may apply for a license that may be small businesses.

#### **IV. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements**

We do not adopt any rules that entail reporting, recordkeeping, and third party consultation. Until we adopt service rules to govern the licensing, operating, and technical aspects of our decision, there are no requirements to impose on any entities.

#### **V. Significant Alternatives to Proposed Rules Which Minimize Significant Economic Impact on Small Entities and Accomplish Stated Objectives**

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<sup>4</sup> 13 C.F.R. § 121.201, Standard Industrial Classification (SIC) 4812.

<sup>5</sup> U.S. Small Business Administration 1992 Economic Census Employment Report, Bureau of the Census, U.S. Department of Commerce, Table 3, SIC 4812 (radiotelephone communications industry data adopted by the SBA Office of Advocacy).

<sup>6</sup> U.S. Bureau of the Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications, and Utilities, UC92-S-1, Subject Series, Establishment and Firm Size, Table 5, Employment Size of Firms: 1992, SIC 4812 (issued May 1995).

We agree with many small entities that opening up the 47 GHz band for commercial uses is timely and feasible, and would be in the public interest. Small entities, such as Avant-Garde and MACOM, see many future market opportunities and have developed equipment, or expect to readily modify equipment, to meet consumer demand for the kinds of services to be provided. Sky Station has developed an innovative technology that uses platforms fixed in the stratosphere to deliver services in an efficient and effective manner. They and other small or new entities will benefit from the demand for commercial applications of their technologies.

We agree with commenters, such as Avant-Garde and Metricom, to adopt the flexible licensing framework we proposed that authorizes any service allowed under the Table of Frequency Allocations. We find that a broadly defined service allocation assures that the 47 GHz band will be used to the greatest benefit of the public by giving licensees, including small entities, the flexibility to meet demands. We also adopt our proposal to prescribe service rules for the licensing of the band based on what the dominant use is likely to be, as demonstrated by the comments. We agree with Avant-Garde to reexamine the likely uses and find that, while the predominant uses are the fixed point-to-multipoint uses we predicted, they would not be based on LMDS-type technology but rather on millimeter wave technology based on stratospheric platforms for delivery of service as proposed for the 47 GHz band by Sky Station. We deny Sky Station's request to modify the Table of Frequency Allocations to protect its service, and find that its need for protection from interference is properly addressed in the future proceeding in which we will establish the technical and operational service rules to govern the authorized services in the band.

We decide to adopt our proposal to license on the basis of geographic areas in order to enable the broadest range of uses for the band and ensure efficient and effective operations. Area-based licensing provides greater operational flexibility and ease of administration that is particularly beneficial to small entities. We defer questions about the appropriate size of the area as raised by Sky Station to our consideration of service rules in a future proceeding. Because of the change in the potential predominant use for the band, we do not adopt our proposed channelization plan and instead revise the subdivision of the spectrum to reflect the proposed uses, as P-Com requests. We agree with Sky Station to divide the bands into five pairs of 100 megahertz channels, with each pair separated by 500 megahertz. This provides adequate bandwidth to accommodate the predominant uses.

## **VI. Report to Congress**

We will submit a copy of this Final Regulatory Flexibility Analysis, along with the Order, in a report to Congress pursuant to 5. U.S.C. § 801(a)(1)(A). A copy of this FRFA will also be published in the Federal Register.